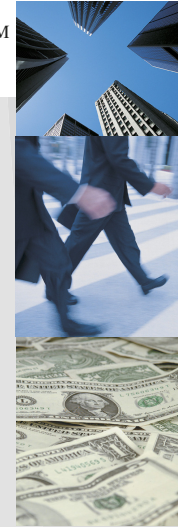
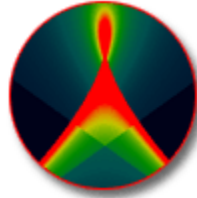


VOLUME
2

ISSUE
16

JULY-AUGUST
2006

Optica Software TM



▶ OPTICA SOFTWARE
NEWS.....1

▶ Q&A MAILBOX/EVENT
SCHEDULE.....3

▶ NOTES FROM THE
DEVELOPER/USER TIPS...4

Optica Software News

The screenshot displays the Rayica software interface. On the left is the 'Slider Control Panel' with various sliders for parameters like θ_1 , x_1 , y_1 , x_2 , y_2 , c_1 , c_2 , t_1 , x_3 , y_3 , c_3 , c_4 , and t_2 . The main window shows a 'Real Time Graphics' plot of a ray trace with green rays passing through several optical elements. Below the plot is the 'Rayica Menu - Beta GUI Version 2' which includes a table of components and their properties.

Order	Component Script/Variable	Component Moved	Active	Resonate
0 G...	GaussianBeam[1, 0.002, NumberOfRays -> 11]	GaussianBeam[1, 0.002, NumberOfRays -> 11]	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1 Pl...	Move[PlanoConcaveLens[-25, 12, 3], {{x1, 25.}, {y1, 0}}, {01, 0}]	Move[PlanoConcaveLens[-25, 12, 3], {{x1, 25.}, {y1, 0}}, {01, 0}]	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2 Pl...	Move[PlanoConcaveLens[-100, 12, 3], 50.]	Move[PlanoConcaveLens[-100, 12, 3], 50.]	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3 S...	SphericalLens[{c1^(-1), 1000}, {c2^(-1), -100}, 25, ...]	Move[SphericalLens[{c1^(-1), 1000}, {c2^(-1), -100}, 25, {t1, 5}], {...}]	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
4 S...	SphericalLens[{c3^(-1), 100}, {c4^(-1), -1000}, 25, ...]	Move[SphericalLens[{c3^(-1), 100}, {c4^(-1), -1000}, 25, {t2, 5}], {...}]	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
5 Sc...	Screen[50]	Move[Screen[50], 200.]	<input checked="" type="checkbox"/>	<input type="checkbox"/>

GRAPHICAL USER INTERFACE (GUI) – Beta Version 2 Released!

We recently released a new version of *Rayica*TM. To take advantage of our new GUI, users will need *Mathematica*[®] 5.2. Users with earlier *Mathematica*[®] versions should [contact us](mailto:contact@opticasoftware.com) directly. For more details regarding the GUI see our website at: <http://www.opticasoftware.com/GUI/index.html>.

[OPTICA SOFTWARE COURSES AND WOLFRAM TECHNOLOGY CONFERENCE](#)

The Wolfram Research Inc. (WRI) Technology Conference 2006 will be held in Champaign, Illinois from October 12-14. Wolfram will be giving pre- and post-conference courses in *Mathematica*® on October 10th, 11th and 15th. Optica Software will also be giving presentations at the conference with our lead developer Donald Barnhart available for questions, demos, and design help.

During this time we also have courses planned which feature *Rayica*™ and *Wavica*™ on October 9th, 11th, and October 16th depending on the interest and skill level of the participants. You are able to take a *Mathematica*® course one day and a *Rayica/Wavica* course the next.

Optica Software is located less than one mile from Wolfram Research. If you are interested please reply and state [sign me up](#). Beginning and advanced users are welcome. For more information on the Wolfram technology conference use this link: [Wolfram Technology Conference](#).

[ONLINE SALE](#)

We are currently offering a **5% discount** on all plans ordered online from our [website](#) through September 30, 2006.

Optica Software is featured in the August 2006 issue of [Physics Today](#) on page 64 in the “Focus on Software” section.

We are presently taking requests for speaking engagements and seminar sessions at your organization to demonstrate our *Rayica*™, *Wavica*™, and *LensLab*™ software products. If you believe you have a project or application where our software may be beneficial, please [contact](#) us for availability to come speak with your staff.

User Testimonial

“Rayica/Wavica has a huge advantage over others in catering to the needs of the evolutionary computation community because it is based on *Mathematica*®...”

Shaine Joseph,
University of Missouri - St. Louis

Site Licenses

Optica Software site licenses are attractively priced and eliminate the hassle of complicated site license administration. Whether you are interested in licensing Optica Software products for use within an academic institution, commercial, government, or non-profit organization, we have designed a site license to fit your needs and your budget. Pricing is determined by the number of users you specify. You can always purchase additional user packs as you increase the number of users.

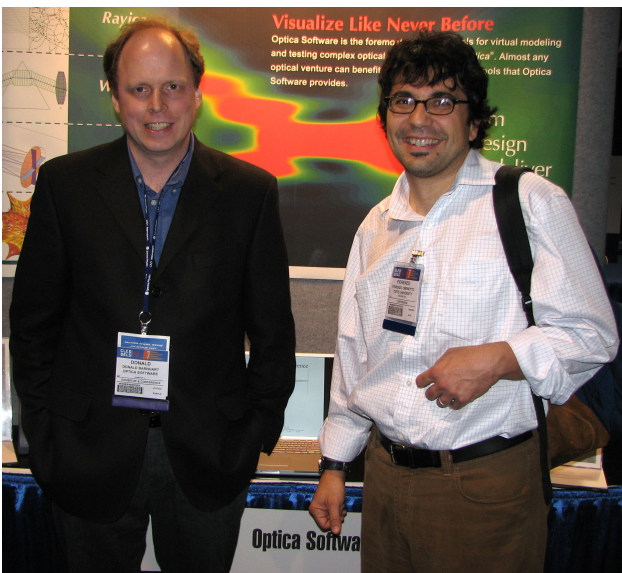
Select your type of organization from the list below to request information on pricing and policies:

[Schools](#): for a single department within a college or university or for use throughout the entire college or university campus.

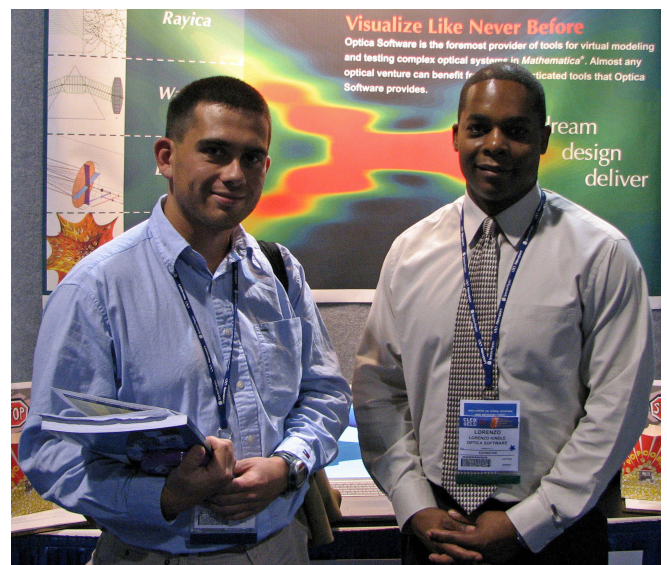
[Commercial](#)

[Government](#)

[Non-profit organizations](#)



Donald Barnhart with Fiorenzo Omenetto from Tufts University at CLEO 2006.



Sales Executive Lorenzo Kindle with Optica Software user and consultant Bodo Schmidt in San Jose, California.



Q&A Mailbox

Q: Where can I get a demo copy of *Mathematica*[®] to try your software?

A: You can request a fully functional *Mathematica*[®] 15-day trial version on the [Wolfram Research web link for demos](#). Download instructions will be immediately emailed to the address you supply and you will have one week from the request date to download. Please keep in mind that this demo version is a save-disabled trial version of *Mathematica 5.2*. If you have further questions about our software contact us for more information.

Submit your questions to our [Optica Software Development Team](#)

Contact Us:

Donald Barnhart, Lead Developer

donald@opticasoftware.com

Lorenzo Kindle, Sales Executive

lorenzo@opticasoftware.com

Ann Williamson, Software Developer

annw@opticasoftware.com

Support

support@opticasoftware.com

Website

www.opticasoftware.com

Phone

217.328.9847

866.328.4298

Fax

217.328.9692

FAQ:

Question: What forms of optimization are supported by *Rayica*[™] and *Wavica*[™]?

Answer: *Rayica* and *Wavica* support all of the popular minimization algorithms, including both constrained and unconstrained methods of minimization. Methods for constrained minimization include the differential-evolution genetic algorithm, simulated annealing, random search, and the Nelder-Mead simplex algorithm. Additionally, *Rayica* and *Wavica* support the following unconstrained minimization methods: Newton, Quasi-Newton, Gauss-Newton, and principle axis (also known as Brent's method).

CONTEST WINNER

Our online survey recipient for **July-August 2006** is **Shaine Joseph**, from **The University of Missouri - St. Louis**, who won the *Rayica-Wavica* Bundle with its new graphical user interface. Please continue to fill out the survey for your chance to win. For more details on how to participate please visit our [homepage](#).

2006 Exhibit Event Schedule

Frontiers in Optics

Rochester, NY

October 10-11, 2006

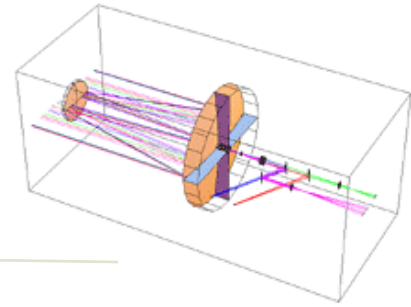
[Frontiers in Optics Exhibit](#)

We have complete in-house expertise for the design and construction of optical systems, mechanical systems, electronic systems, assembled prototypes and fabricated products. As such, we offer true vertically integrated services for systems design, modeling, and manufacturing. [Contact](#) us for a full-service quote on your next project.



Notes from the Developer

Donald Barnhart, Ph.D. – Optica Software Lead Developer
donald@opticasoftware.com



About the Developer

[Donald Barnhart](#) has been developing optical design and analysis software in *Mathematica*[®] since 1991. In 1994, while working on his master's degree, he developed the world's first successful holographic instrument to measure three-dimensional velocity fields in fluids. He completed his Ph.D. in 2001 at Loughborough University in England.

USER TIP

Luneberg Lens: A case study in graded index refraction.

(Written in collaboration between Dr. Donald Barnhart, Optica Software and Dr. David Hayes, Plasma Antennas Limited, UK)

You can model arbitrary forms of graded index refraction in *Rayica*[™]. Most commercial forms of graded index lenses are limited to either one-dimensional (Gradium) or axially symmetric refractive index variations. In the world of text books (and micro-waves), however, the canonical graded index lens example is the Luneberg lens. This lens has the unique distinction of behaving as an ideal imager of plane waves (see figure). Unfortunately, present-day fabrication techniques have thus far eluded the fabrication of such a beast (for optical wavelengths anyway). But this does not prevent us from modeling the Luneberg lens in *Rayica*. You can learn more about the Luneberg Lens and graded index refraction by visiting our website at www.opticasoftware.com/support.

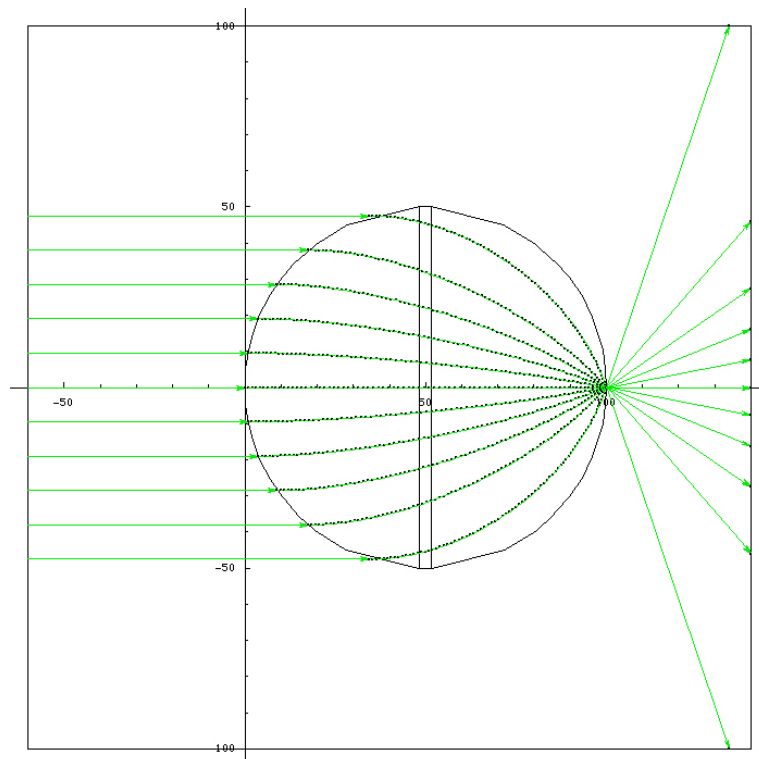


Figure 1: Luneberg Lens

DEMO VERSIONS

We have implemented password protection in our software which enables us to offer [DEMO](#) versions of our software. Please [contact us](#) for more information.

At the urging of our users we have decided to give some of our **DEMO** versions full capability. Therefore, *Rayica*[™] and *Wavica*[™] are now available in **DEMO** mode, where you are introduced to our NEW graphical user interface (GUI). After trying out our **DEMO** you may purchase a single user license.

2006 Order Form

For your convenience you may now submit your orders by fax or email [2006 Price List and Order Form](#).

To unsubscribe from this newsletter [click here](#)

Advantages of our software

Our software packages integrate with *Mathematica*[®] and leverage their functionality alongside its robust repertoire of symbolic, numeric, and graphical capabilities. Users can create models, perform high-level analysis, and produce professional-quality blueprints or reports all within a single software environment.

FREE UPGRADES

The bottom right section of our [homepage](#) shows the latest “**build date**” for our software. As of this publication, we have released the **Developmental Beta Version 2 of our NEW Graphical User Interface**. If you currently subscribe to our technical Annual Support Plan (ASP) you are entitled to upgrade your software free of charge. Customers who have ordered our software within the past 90 days are also entitled to upgrade as part of the 90 day support plan package included with your software purchase. Order our technical Annual Support Plan today to receive a 5% online discount and these new upgrades.

[Order Annual Support Plan](#)

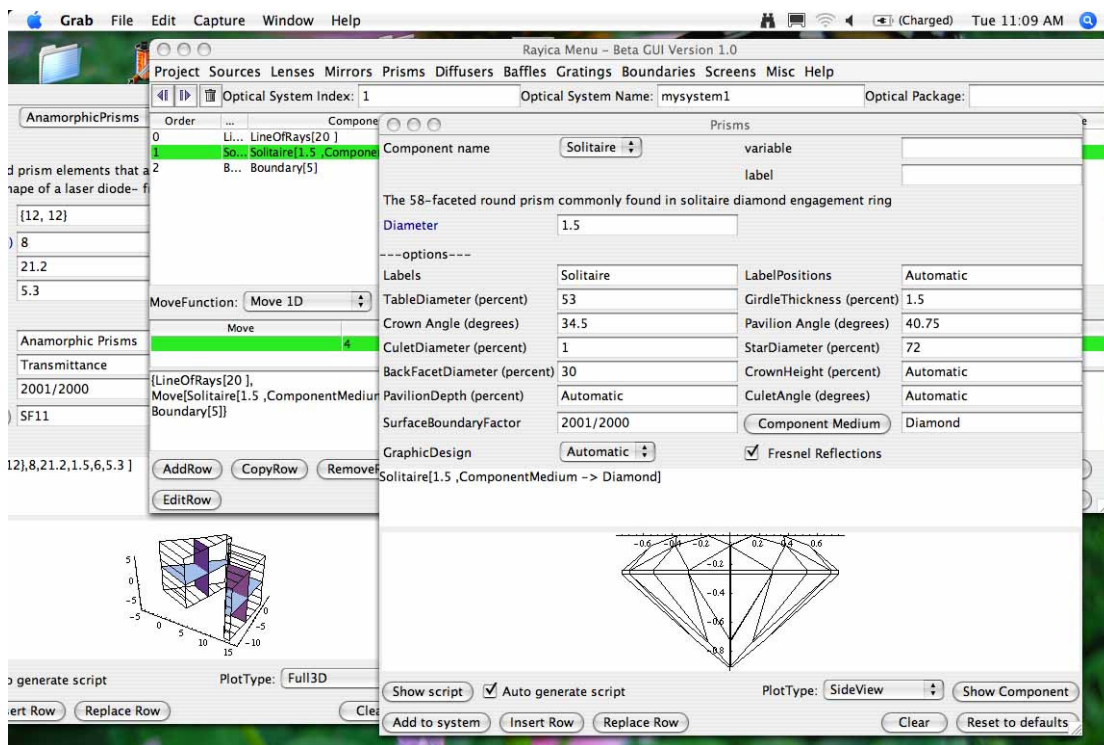


Figure 2: Example of a solitaire diamond.

Not currently on our mailing list? [Sign-up for a free account](#)